Experimental Studies in BEHAVIOUR THERAPY

Lars-Göran Öst

1976

Scandinavian Journal of Behaviour Therapy

Vol 5 1976 Supplementum 1

Scandinavian Journal of Behaviour Therapy is published quarterly by the Swedish Association for Behaviour Therapy (BTF) in cooperation with other Scandinavian Behaviour Therapy Associations (DAF, NAFo).

Nordisk tidskrift för
BETEENDETERAPI
Scandinavian Journal of Behaviour Therapy

Editor: K Gunnar Götestam

Assitant Editors: Karl-O Fagerström, Hilmar Johansen, Terttu Pajunen, Preben Wagner

Subscriptions:
Four issues constitute one volume. Price per volume Swedish Crowns 20. Orders should be sent to address below. For members in the Scandinavian Behaviour Therapy Associations (BTF, DAF, NAFo) the journal is included in the membership (see information inside the journal).

The journal is indexed in *Psychological Abstracts*.

Editorial and business address:
c/o K G Götestam, Ulleråker Hospital, S-750 17 Uppsala, Sweden, tel 018/10 00 00, ext 201.

National Postal Account (postgiro): 11 84 99-3.

AB MATS ZETOGS FÖRLAG UPPSALA 1976

EXPERIMENTAL STUDIES IN BEHAVIOUR THERAPY

Akademisk avhandling

som för vinnande av doktorsexamen
med samhällsvetenskapliga fakultetens tillstånd
framlägges till offentlig granskning
onsdagen den 19 maj 1976 kl 10.00
vid Stockholms Universitet
hörsal 9, hus D, Frescati

av
Lars-Göran Öst
Fil. kand.

Stockholm 1976

Digitized by the Internet Archive
in 2026

https://archive.org/details/IA41552723_0144

Experimental Studies in BEHAVIOUR THERAPY

Lars-Göran Öst

INSTITUTE OF EDUCATION

UNIV.
LEIDEN
BIBL.

© Larş-Göran Öst 1976

Psychiatric Research Center
Ulleråker Hospital
S-750 17 Uppsala, Sweden

PREFACE

This dissertation is based on the following studies:

I. Eriksson, J.H., Götestam, K.G., Melin, L. & Öst, L-G. A token economy treatment of drug addiction. Behaviour Research and Therapy, 1975, 13, 113-125.

II. Öst, L-G., Melin, L., L. & Götestam, K.G. A token economy program for chronic schizophrenic patients. Scandinavian Journal of Psychology, 1976, in press.

III. Öst, L-G., Götestam, K.G. & Melin, L. A controlled study of two behavioral methods in the treatment of stuttering[1]. Behavior Therapy, 1976, in press.

IV. Öst, L-G. & Götestam, K.G. Behavioral and pharmacological treatments for obesity: An experimental comparison.[2] Addictive Behaviors, 1976, in press.

These papers will be referred to by the Roman figures I to IV.

The responsibility for these reports is distributed in the following way. For report I the responsibility was equally shared and for report II-IV I was the senior author

The investigations were performed at the Psychiatric Research Center, Ulleråker Hospital, University of Uppsala, Sweden. They were supported by grants from the Swedish Medical Research Council, the Swedish Council for Social Science Research, the Swedish National

---

1 and 2. Some of the data in these studies have been reported as masters degree these by Johannesson & Persson (1974) and Botella, Sandström & Wadelius (1975) with the present authors as supervisor.

Board of Health and Welfare, Anton and Dorotea Bexelius' Foundation, and Alfred E. Benzon A/S.

I wish to thank Docent Torbjörn Stockfelt, who has always supported and encouraged my work and given me very valuable comments on the manuscripts.

I am greatly indebted to Professor Lars-Magnus Gunne for giving me the opportunity to carry out study I and II, as well as providing very valuable suggestions and comments during all phases of these studies.

I am also indebted to Lennart Melin, K. Gunnar Götestam, and Jan H. Eriksson for a stimulating and valuable collaboration during the planning, implementing and reporting phases of the present studies.

This dissertation would not have been possible without the dedicated work of many persons: Eva Persson and Göran Johannesson served as therapists, Karl O. Fagerström administered the follow-up testing, and Hand Lindholm and Ylva Segnestam referred clients in study III. Charlotte Botella, Eva Sandström, Lotta Wadelius, and Peter Lantz served as therapists in study IV. The staff of ward 106 (study I) and 104:A (study II) made a skillful and efficient job as para-professional therapists. Monika Forsling, Anita Liberg, and Anna-Karin Nyberg typed the manuscripts. Finally, my colleagues at the Psychiatric Research Center have given many valuable comments and suggestions which have improved the present dissertation. I want to express my sincere gratitude to all of them.

Last, but not least, my special thanks to my dear Margareta for her showing patience with me and reinforcing me at the right moments, and little Ulrika who accepted her father's all-absorbing work but still continuously reinforced his intermittently playing with her. To them I dedicate this dissertation.

Uppsala, April 1976

Lars-Göran Öst

INTRODUCTION

The term behavior therapy was first used in 1953 by Lindsley, Skinner & Solomon in describing their work with psychotic patients. There are, however, isolated examples of behavioral principles being used in the treatment of psychological problems since the 1920's. Still it was not until the early 1960's that behavior therapy became known as an alternative to traditional psychiatric or psychodynamic therapy. Three important milestones in this development are the books "Psychotherapy by Reciprocal Inhibition" (Wolpe 1958) and "Behaviour Therapy and the Neuroses" (Eysenck 1960) and the journal "Behaviour Research and Therapy" (Ed. Eysenck) that started in 1963.

During the 1960's and the first half of the 1970's there has been a very rapid development of behavior therapy research and applications. Hoon & Lindsley (1974) reviewed the Psychological Abstracts and found that the number of behavior therapy publications/year had increased from 1 in 1960 to about 800 in 1972 (when it surpassed the number of publications on psychoanalysis). Furthermore, in 1971 over 50% of the research projects in clinical psychology and psychiatry receiving grants from the National Institute of Mental Health in USA concerned behavior therapy (Stolz 1973).

The application of behavior therapy in Sweden was started in the late 1960's. At first these applications were almost exclusively clinical but later behavioral techniques have also been used in schools (Wallin 1975), in the treatment of criminals (Johnson 1973, Sandberg 1975), and for mentally retarded (Andersson, Danielsson & Westerling 1972). When the present project started in 1972, there were within the field of clinical psychology and psychiatry, to the author's knowledge, only uncontrolled case studies. Later, experimental studies on clinical problems have also been published (e.g. Claeson & Malm 1973, Melin & Götestam 1973).

Purpose

As the present series of studies are the first to experimentally evaluate behavior therapy techniques for clinical problems (in Sweden) it was considered suitable to have a rather broad purpose.

The general purpose of the present project was to apply behavioral methods, under controlled conditions, in the treatment of clients who can be regarded as "involved in" (or handicapped by) their problems to different extents.

The four groups of clients treated in these studies are drug addicts (I), chronic schizophrenics (II), stutterers (III) and obese persons (IV). Generally speaking, these psychological problems can be placed along a dimension of how encompassing the problem is. The chronic schizophrenic is mostly hospitalized, passive, often apathetic and uninterested in his own situation and "carries his problem with him all the time". A drug addict is also to a very large extent involved by his addiction, but maybe not as much as the chronic schizophrenic. An obese person of course carries her/his body around every minute, but the problem is manifested primarily in eating situations (overeating) and in social interactions. Finally, the stutterer's problem is evident above all in verbal interactions, but for many stutterers only in some specific social situations that can be regarded as stressful. (The above description of a "dimension of involvement" may be regarded as construed and not applicable in every case, but it may serve as a description of the scope of the present project).

One common feature of the problems studied is that they are all considered as disorders that are difficult to treat from a traditional psychiatric or psychodynamic point of view. (For discussions on these subjects see Gunne 1975 (drug addiction), Paul 1969 (chronic schizophrenia), Webster 1974 (stuttering) and Stunkard 1972 (obesity).)

A secondary purpose of the present studies was to apply and evaluate treatment methods that hitherto have only been used in uncontrolled case studies (III and IV) or not at all for the present client group (I).

As it is not possible in this paper to present a literature review for each of the four psychological problems treated the reader is referred to the following reviews of behavior therapy research in the respective areas:

(I) drug addiction: Callner (1975), Götestam, Melin & Öst (1976).

(II) chronic schizophrenia: Kazdin & Bootzin (1972), DiScipio (1974), Gripp & Magaro (1974).

(III) stuttering: Webster (1974), Yates (1970, 1975), Johannesson & Persson (1974).

(IV) obesity: Stunkard (1972), Abramson (1973), Hall & Hall (1974), Bellack (1975), Botella, Sandström & Wadelius (1975).

Subjects

The subjects treated in the present studies were obtained in different ways. For study I and II the subjects were in-patients at the Ulleråker Hospital. For study III and IV subjects were obtained through advertisments in the local newspaper. Furthermore, some subjects in study III were recruited from the waiting-list of the phoniatric clinic at the University Hospital of Uppsala.

Criteria for inclusion. In study I (drug addicts) there were no specific criteria for including a patient in the study. All patients that were detoxified during the 34 weeks program period were offered to choose between entering the treatment program, going to a ward with traditional psychiatric care or leaving the hospital altogether. Of the 160 detoxified patients 55 entered the treatment unit. No exclusion criteria were applied. However, if a patient stayed on the ward two days or less his data were excluded from the results. This was the case for three patients.

In study II (chronic schizophrenics) the criteria were that the patient should have a diagnosis of schizophrenia of some type, have been hospitalized for at least five years, and not be over 60 years of age. The only exclusion criterion was a known brain damage. Twelve patients were included in the study.

In study III (stutterers) all persons who answered the advertisment or an invitation letter (for those on the waiting-list) were offered to participate in the study, providing they had at least 3% nonfluency in their speech. Nine of the 24 subjects tested before treatment were excluded for this reason, leaving 15 that participated in the study.

In study IV (obese persons) there were three criteria. First, the subject had to be at least 15% overweight (according to Natvig 1956). Second, the potential subjects had to make self-recordings of weight,

food intake and excercise for 7-14 days. Finally, they had to come to a pre-treatment weighing. Of the 64 persons fulfilling these criteria 45 were randomly assigned (by using a table of random numbers) to three groups. The 19 remaining persons were placed on a waiting--list for later treatment.

Voluntary or compulsory participation?

A general principle in the application of behavioral techniques is that the patient should participate in the treatment voluntarily. If this is not the case, and a therapist is forcing treatment on a client it would be unethical. Furthermore, when a person is coerced to participate against his own choice the probability of a favorable outcome is low. The possibility of the person performing "desirable" behaviors in order to reduce or escape from an aversive situation is very high, and thus the behavior changes will not be maintained when the treatment program is ended.

In the present series of studies all patients' participation in the treatment program was voluntary. In study I (drug addicts) all patients that were detoxified during the time of the study, were given thorough description of the treatment program. This included information about his privileges and responsibilities when participating in the program. Before making his choice between the experimental ward, a ward with traditional psychiatric treatment, and leaving the hospital altogether, the patient was reminded that he could leave the program at any time even if he had not been voluntarily admitted to the hospital in the first place. There might, however, have been other types of coercion on the patients, e.g. a problematic economical and/or social situation, a "drug pusher" demanding payment that was overdue etc. To the author's knowledge, this kind of coercion was not present for any of the subjects. If it had been the case it would have been ethically questionable to include that patient in the program. However, one can not completely exclude the possibility that this type of coercion may have entered into the

decision process for some of the subjects. Clearly the experimenter is not responsible for this kind of coercion, and the conclusion is that the treatment program was as voluntary as possible under the circumstances.

In study II, the chronic schizophrenic patients were informed (as thoroughly as possible) about the treatment program before they were admitted to the ward. All had the opportunity to choose between staying on their original ward and being transferred to the experimental ward. Furthermore, if any patient wanted to terminate his participation in the program he would be returned to his original ward or, if voluntarily admitted, be discharged from the hospital. As might have been the case in study I, perhaps some subjects in this one may have chosen to come to the experimental ward in order to escape from an aversive situation on the original ward. However, this was outside the experimenter's control. A common feature of both study I and II was that if a patient chose not to participate in the program but wanted to remain on the experimental ward he was free to do so. Then, of course, he did not get access to any of the privileges or back-up reinforces in these programs.

In study III (stutterers) and IV (obese) the subjects answered an advertisment about the experiments. Before the start of the treatment they were thoroughly informed about every relevant aspect of the treatment and had the opportunity to decline participation at that time as well as at any time during the study. None of the subjects in study III did so, while this was the case for two of the subjects randomized into the pharmacological treatment in study IV. In the latter study there was a further attrition of four subjects in each of the treatment groups, one because of side effects from the pharmacological treatment.

In summary, it must be considered that due care was taken not to coerce the subjects to participate in these treatment programs against their own choice.

The fact that all subjects participating in these studies did so voluntarily of course means that there is a "selection" of sub-

jects. According to the author's opinion all forms of psychotherapy should be voluntary, both from the client's and the therapist's point of view. In this respect the present studies are not exceptional. However, the type of selection that is methodologically fatal, e.g. just including the type of subjects that empirically have proved to do well with a certain technique or not randomizing the subjects (if it is possible), has not been "used" in the present studies.

Treatments

Study I was the third ward-wide treatment program for drug addicts at the clinic. The two earlier studies (Melin & Götestam 1973, Melin, Andersson & Götestam 1975) can be characterized as contingency management programs, which means that the relationship between performed behaviors and back-up reinforcers was of an all--or-none character. The patients had to perform almost all of the activities to get access to any (and all) of the back-up reinforcers. In the token economy applied in study I the relationship was much more flexible. For each activity the patient performed he received a certain amount of tokens (points) and with these points he could get access the back-up reinforcers (provided he reached the daily criterion for leaving the ward, 15 points). It was attempted to apply the token economy principles in a way that corresponded as much as possible to the generally accepted way (e.g. Ayllon & Azrin 1968, Kazdin & Bootzin 1972). This was also the aim in study II (chronic schizophrenics). Common to both these token economy programs was that all back-up reinforcers were decided upon by interwieving the patients before the program started. The reinforced activities were decided upon in discussions with the staff and, for study I, with the patients to a certain degree. In study I the drug addicts could also influence the number of tokens received for each reinforced activity. Generally speaking, the token economies applied in study I and II meant that when the patients performed certain low-frequency behaviors they were reinforced, both with tokens and verbally. With the

tokens they could get access to the back-up reinforcers. (For further descriptions see I, p. 116, and II, p. 6.)

The methods used in study III, metronome conditioned speech retraining (MCSR) and shadowing, have very sparse (shadowing) or no (MCSR) experimental support. MCSR was developed by Brady (1969, 1971) and the present application was tailored after his description as closely as possible. This method consisted of four steps. In step one and two the subject practiced pacing his speech to a desk metronome while gradually increasing the rate. In the third phase the subject paced his speech to an electronic ear-metronome while speaking in gradually more difficult natural situations. Finally in the fourth phase the subject was to discontinue the use of the metronome, starting with the easiest situation. The shadowing technique was applied in a way that was as similar as possible to Cherry & Sayers' (1956) and Kondas' (1967). In shadowing the therapist read a text or spoke freely while the subject repeated what the therapist said with as short a delay as possible. (For a further description see III, p. 4.)

In study IV the behavioral method was, with a few exceptions, that of Stuart & Davis (1972). This method consisted of three parts: situational control of overeating, nutrition management program, and exercise management program (see IV, p. 4). The pharmacological method was applied according to the recommendations of the producer of the drug fenfluramine (Ponderal^{R}, A/S Alfred Benzon). Chemically fenfluramine is an amphetamine derivative with anorexic properties, but very little central stimulant effects.

As this was the first attempt to experimentally evaluate the applied methods (study III and IV) it was considered desirable to apply them in the way they have been described in the literature and realistically would be used in a clinical-therapeutic situation.

Therapists. In study I and II the staff served as therapists. Besides the continuous supervision of the author, the staff in study I was given a short introduction only, while the staff in study II was given a one-week theoretical course on the principles of a token economy. The therapists in study III and IV were undergraduate psychology

students with about six months experience in behavior therapy. They were continuously supervised by the author during their treatment of the subjects.

Designs

In study I and II a group reversal (ABAB) design was used to evaluate the effects of the applied treatment technique. This design was originally developed (Baer, Wolff & Risley 1968) in the operant psychology area for use when N=1 (single subject design, Barlow & Hersen 1973). However, the reversal design and other types of single-subject designs have been used in group studies as well. The rationale for these designs is that each subject (or group) serves as it's own control through the change in phases (A1=baseline, B1=treatment, A2=reversal to baseline conditions, B2=treatment). This means that it is not necessary to have an untreated control group.

Jeffrey (1974 a) discussed a number of situations in which a within-subject design was preferable to a between-subject design and vice versa. A within-subject design is to prefer for instance, "when it is the most convincing means of demonstrating the causal or functional relationship between a behavior and its controlling variables.. when reversals are possible and acceptable... when enough subjects are not available... when the subjects available for an experiment are not homogenous." (p. 173).

These situations were at hand in study I and II. A primary purpose was to test the functional relationship between the token economy program and the subjects' target behaviors on the ward. These wards accomodated 12 patients only, but the mean number of patients staying on the ward was six for the drug addiction study (I) and 11 for the study on chronic schizophrenics (II), which made a between-subject design impossible to use. Furthermore, it was considered possible to reverse (withdraw) the treatment method for a short period of time, as this has been reported in the literature (e.g. Melin, Andersson & Götestam 1975, Lloyd & Garlington 1968).

The question of reversability is difficult both from a methodological and ethical point of view. Methodologically it has been questioned (e.g. Hartmann & Atkinson 1973) if it is possible to return to the conditions prevailing during baseline. This is partly a misunderstanding. What is necessary is only the withdrawal (in A2) of the treatment technique applied in B1. The reason for this procedure is that it is necessary to control for other changes (e.g. instructions, staff schedules etc.) that possibly could have been introduced at the same time as the treatment method (Barlow & Hersen 1973).

Ethically it would be hard to defend the withdrawal of a technique that has shown a positive influence on the patients' behaviors. However, most empirical findings show that the reversal phase does not have to be very long in order to show if the behavior reverses or is maintained on the same level as in the treatment phase. In the present studies the reversal phases were three and two weeks respectively. This should be compard to eight weeks preceding and 18 weeks following the reversal in study I, while the corresponding figures in study II were 27 and three respectively.

Jeffrey (1974a)also discussed some of the situations in which a between-subject design is preferred over the within-subject design. The most important in regard to study III and IV are : "when the relative effectiveness of different treatment procedures is examined... when it is impossible or undesirable to reverse a behavior... when it is impossible to take non-reactive repeated measurements." (p. 173-174).

The purpose of both study III and IV was to compare the effectiveness of two different treatments to a control condition. Furthermore, as the applied techniques included a continuous learning of new behaviors (except for the pharmacological method in study IV), a reversal would hardly be possible. Finally, a continuous measurement of the subjects' stuttering probably would create a great deal of reactivity in the outcome measures of study III. In study IV, however, the subjects were weighed at each session as the possible reactivity from this procedure was not considered detrimental. The design used

was the same in both studies, a "pretest-posttest control group design" (Campbell & Stanley 1966) with three groups.

The control-group designs have also been questioned from an ethical point of view. It is considered unethical not to give treatment to persons in need of therapy when an effective treatment is available, but instead use them as a control group. The crucial point here is "effective". As soon as a specific treatment has proved to be effective under controlled experimental conditions there is no need for an untreated control group. This is, however, not the case for the treatments evaluated in study III and IV. Both the MCSR for stutterers and Stuart & Davis' method for the obese have only been reported in uncontrolled case studies up till now. The control subjects in both study III and IV were not told that they were controls but rather that they, due to the large amount of applicants, could not receive treatment at that time but were placed on a waiting-list for later treatment. This is also in progress for some control subjects in study IV, while none of the control subjects in study III wanted treatment when they were offered.

Assessment

The choice of relevant dependent variables (outcome measures) is crucial in the evaluation of any treatment method. Which criteria to use in evaluating treatment effects have for many years been debated in the psychotherapy research literature (e.g. Bergin & Garfield 1971, Bergin & Strupp 1972).

There exists a wide range of opinions on this issue, from clichés like "psychological phenomena can not be measured objectively and thus we should not bother to try" to "only objectively measured, overt behaviors should be considered in evaluating treatment outcome". When doing behavior therapy research it is desirable to strive for as relevant and reliable measures as possible in any given situation. This does not mean, however, that one should let the availability of "objective measures" govern the choice of outcome criteria. Instead

one should try to develop valid measures of behaviors (both covert and overt) that are relevant for evaluating the applied treatment technique. An attempt to measure a behavior may be "less objective and premature" but will sometimes serve as an impetus to other researchers who might develop it further.

Furthermore, it is necessary to use multiple measures in psychotherapy research. The development in this area has not come up with any single outcome measure that can be considered as the only suitable for every psychotherapeutic method. Most psychological problems consist of at least three components: a behavioral, a physiological, and a cognitive-verbal component. Research concerning the relationship between these components is very sparse, but the empirical evidence (e.g. Lang 1968, 1971) seems to show only moderate (0.50-0.60) intercorrelations, a fact which points to the necessity of multiple outcome measures.

In the present studies the following measures were taken. In study I, 35 reinforced behaviors (I, p. 116) two non-reinforced behaviors (I, p. 122) and the number of drug intoxications while on the ward were registered continuously (through observation and gas-liquid chromatography). In study II (table 1 and 2), there were also 35 reinforced behaviors continuously measured as well as the medicine prescribed. Furthermore, the discharged patients' status on the one year follow-up occasion were obtained by consulting their psychiatric records. In study III and IV the subjects were assessed pre, post and at follow-up, one year after the end of treatment. In the third study the stutterers percentage of non-fluency and number of words spoken per minute were obtained in a laboratory setting during spontaneous speech and reading aloud. Furthermore, the subjects filled up "Stutterer's Self-Rating of Reactions to Speech Situations" (Form 16; Johnson, Darley & Spriesterbach 1963), an inventory consisting of 40 situations. Finally, in study IV three measures were obtained on the different occasions: (1) weight in kg, (2) per cent overweight, and (3) weightreduction index (Jeffrey 1974b). Furthermore, the subjects made self-recordings of food intake and exercise, and answered

different questionnaires concerning their experience of the treatment program applied.

Reliability. The inter-observer reliabilities obtained in studies I-III are shown in table 1.

Table 1: Interobserver reliability measured as per cent agreement between two independent observers.

Measures	Study I	Study II	Study III
1. Up and dressed in the morning	97-100	100	-
2. Morning conference	83-100	100	-
3. Bed making	100-100	92	-
4. Occupational therapy	83-100	-	-
5. Number of booked activities	-	100	-
6. Booked activities performed	-	95	-
7. Percent nonfluency	-	-	90.4
8. Number of words spoken/min	-	-	99.7

The obtained figures for percent agreement between two independent observers varied between 83 and 100% with a mean of 96%, which must be considered as satisfactory.

It was not possible to use physiological measures in the present studies. However, this would have been meaningful in study III only. There is a dominance for behavioral measures and only study III and IV used measures of the cognitive-verbal component. Ideally, study I should have been completed with some kind of self-rating inventory. This would hardly be fruitful in study II, but for the chronic schizophrenics further information could have been obtained by using some type of psychiatric rating scale.

Statistical methods

In order to use analysis of variance for an ABAB-design the same patients must generate data for all four phases. This was not the case for study I as the program lasted 34 weeks and the mean treatment time per patient was 17 days. To still be able to analyse the results statistically the following procedure was applied. The patient group was divided into those who stayed on the ward during one phase only (n=31) and those who stayed during two (or more) phases (n=21). For the latter group, the mean number of points/day during the token economy phases (B1 and B2) and during the non-treatment phases (A1, A2 and C) were compared. In order to minimize the attrition this comparison was restricted to the last five days in the first phase (of the subject's treatment period) and the first five days in the second phase.

The data of the 31 patients who stayed on the ward during one phase only was analysed to test the effects of time spent on the ward per se. For this group the mean number of points/day for the first five days was compared to the last five days of their treatment periods. In both these comparisons a t-test for correlated samples was used.

In study II one patient was discharged after five weeks and his data was excluded from the analysis. For the other patients, the mean percentages of performance for each phase were calculated and one--tailed sign tests (Siegel 1956) were performed to test the differences between consecutive phases in the design.

In the study III analysis of variance was used and in study IV analysis of covariance because of pre-treatment differences between the two experimental groups and the control group.

Study I (drug addicts)

General results. The mean number of points collected/day and patients was significantly higher during the token economy periods than during the non-treatment periods (16.3 vs. 8.7; ($p < .01$) for the group going from a non-treatment phase and 19.5 vs. 9.6 ($p < .001$) for those going from a treatment to a non-treatment phase).

Reinforced activities. The patients activity-levels in the reinforced activities (see table 2) changed between phases in the expected way, (i.e. increased during B1, decreased during A2, increased during B2 and decreased during C). There was, however, one exception: "getting up in the morning" continued to increase during the reversal period (A2).

Non-reinforced activities. It was expected that the two activities not reinforced, ward meetings and group therapy, would change contrarily to the reinforced activities. This was also the case, but only during the first treatment phase (B1). When the token economy was reversed in A2 these two activities continued to decrease.

Intoxications on the ward. The proportion of patients giving their urine samples on time increased during the treatment phases and decreased during the non-treatment phases (A1 and A2). The proportion of intoxications (.i.e. positive urine samples) changed in the other direction. The patients' activity-levels were, however, not significantly affected by their intoxications.

Conclusions. The main conclusion that can be drawn from this study is that it was the contingent token reinforcement applied in the treatment phases (B1 and B2) rather than some extraneous variables, that influenced the patients' activity-level. All but one of the behaviors studied changed between phases in the expected way. Furthermore, the two non-reinforced activities were not influenced in any way by the reinforcement contingencies applied to the other activi-

ties studied. Finally, the token economy seemed to reduce the frequency of intoxications on the ward.

Table 2. Direction of change between phases for the behaviors studied in study I. (↗ = increase, ↘ = decrease)

Behaviors studied	A1-B1	B1-A2	A2-B2	B2-C
Reinforced activities:				
1. Up and dressed in the morning	↗	↗	↗	↘
2. Morning conference	↗	↘	↗	↘
3. Bed making	↗	↘	↗	↘
4. Physical exercise	↗	↘	↗	↘
5. Proportion of patients that have booked at least one activity/day	↗	↘	↗	↘
6. Total activity	↗	↘	↗	↘
7. Proportion of patients reaching the daily criterion	↗	↘	↗	↘
8. Mean number of points/day	↗	↘	↗	↘
Non-reinforced activities:				
1. Ward meetings	↘	↘	↗	—
2. Group therapy	↘	↘	↗	0
Intoxications:				
1. Proportion of patients giving their urine sample on time	↗	↘	↗	—
2. Proportion of positive urine samples	↘	↗	↘	—

From an administrative point of view, it was possible to implement a token economy program for drug addicts that was flexible, had use for surplus points (above the daily criterion) and delayed the negative consequences for only one day (which were the disadvantages of the earlier programs at the clinic).

The results (regarding changes between phases) obtained in this study were the same for all but one of the reinforced behaviors. This together with the fact that an ABAB-design was used makes it difficult to believe that any other factor than the application and withdrawal of the token economy program was responsible for the outcome.

Study II (chronic schizophrenics)

Contingent reinforcement. The direction of change between the different phases for the reinforced activities are shown in table 3.

Table 3: The direction of changes between the different phases (↗ = increase, ↘ = decrease)

Activity	A1 - B1	B1 - A2	A2 - B2	B2 - C
1. Up and dressed	↗	↘	↗	—
2. Morning conference	↗	↘	↗	—
3. Bed making	↗	↘	↗	—
4. Exercise walks	↗	↘	↗	↘
5. Unsolicited ingestion of medicine	↗	—	—	↗
6. No. of booked activities	↗	—	—	—
7. Bookable activities performed	↗	↘	↗	↘

It is clear from this table that the frequency of the reinforced behaviors changed in the expected way (increased) when the token economy was inserted in B1, withdrawn in A2 (decreased), and reinstated in B2 (increased). There was, however, one exception to this general pattern. Unsolicited ingestion of medicine did not decrease in A2,

nor did it increase in B2, but stayed at the same level throughout these phases.

Non-contingent reinforcement. From earlier research on token reinforcement (see Gripp & Magaro 1974) it was expected that the contingent reinforcement would yield results similar to the baseline and reversal conditions. This was, however, the case for only two of the six reinforced activities: exercise walks and bookable activities performed (see table 3). Three of the activities (up and dressed in the morning, morning conference and bed making) did not change from the preceding phase with contingent reinforcement, but unsolicited ingestion of medicine unexpectedly increased during the non-contingent reinforcement phase.

Conclusions. As was the case for study I, the general conclusion that can be drawn from this study is that the contingent token reinforcement exerted a high degree of control over the patients' activity-levels in the behaviors studied. Concerning the effects of non--contingent reinforcement it is not possible to draw any unequivocal conclusions, since two of the behaviors studied changed in the expected way (decreased), one in the reversed way (increased), and three behaviors did not change significantly at all.

The design used in this study and the results obtained were essentially the same as for study I. Here too it is unlikely that any extraneous variable, and not the token economy program, is responsible for the effects observed. The results of the non-contingent reinforcement (NCR), however, questioned the widely accepted hypothesis concerning the effects of NCR (see II, p. 19).

Study III (stutterers).

General results. There were no significant between-group differences after treatment or on the 14-month follow-up occasion.

Spontaneous speech. The percentage of non-fluent speech was significantly reduced over time for the group receiving metronome condi-

tioned speech retraining (table 4). The shadowing group and the waiting-list control group did not change significantly on the measure of fluency. The number of words spoken/min. did not change in any of the groups.

Table 4: Per cent non-fluency during spontaneous speech for the three groups. (n=5 in each group).

Group	Before	After	Follow-up	p
MCSR	16.6	9.3	9.3	p<.05
Shad.	14.4	12.2	9.6	NS
W-1 C	17.2	12.8	9.5	NS

Reading aloud. The number of words read/min. increased significantly for the shadowing group but not for the other two groups (table 5). None of the groups reduced their percentage of nonfluent speech in the reading aloud test.

Table 5: Number of words read/min during reading aloud for the three groups. (n=5 in each group).

Group	Before	After	Follow-up	p
MCSR	108.0	116.0	105.2	NS
Shad.	74.6	84.8	90.2	p<.05
W-1 c.	123.6	130.4	116.0	NS

Form 16. The analysis of variance for the Form 16 inventory did not yield any significant between-groups and within-groups differences.

Conclusions. No conclusion can be drawn from this study concerning which of the two applied treatment techniques is to be preferred in the treatment of stuttering. The subjects treated with metronome conditioned speech retraining became more fluent during spontaneous

speech but did not speak faster. (However, their rate of speech was already within the normal range.) The subjects treated with shadowing increased their rate of speech during reading but their decrease of nonfluency was not significant.

The results did not show that any of the experimental methods applied ameliorated the subjects' stuttering to a larger extent than no treatment. The most probable reason for this outcome is the fact that the number of sessions (20) of treatment was too small, e.g. only one of the five subjects receiving metronome conditioned speech retraining managed to complete the treatment program in time. Another factor that may have contributed to the relatively poor outcome is if there was not a large enough transfer from the therapy situation to the subjects' natural environments.

Study IV (obese)

General results. A general result from the analysis of covariance was significant F-values both between and within groups when the before vs. after differences were tested. When it comes to the before vs. follow-up difference only the within-group F-values were significant.

Table 6: Weight in kg. for the three groups before, after and at follow-up. Statistical comparisons within and between groups. (n=15 in each group).

	Before	After	F.-up	B.vs. F-up	Comparison	After	F.-up
Behavioral	87.0	77.6	82.6	-4.6	B vs P	NS	NS
		xxx	xx	x			
Pharmacological	86.6	80.8	85.7	-0.9	B vs C	xx	NS
		xx	xxx	NS			
Waiting-list contr	81.5	77.9	79.0	-2.5	P vs C	NS	NS
		x	NS	NS			

Weight in kg. All three groups had reduced their mean weights after treatment. The mean weight loss was 9.35 kg for the behavioral group, 5.72 kg for the pharmacological group and 3.51 kg for the waiting-list control group. On the one year follow-up occasion both experimental groups had (compared to post-treatment) increased their mean weight significantly, but the small increase for the control group was not significant. A comparison with the initial weight did, however, show that the behavioral group was the only group with a significantly lower mean weight at follow-up than before treatment. The between-group comparisons after treatment showed that the behavioral group had a significantly larger weight loss than the control group. The other differences were not significant. At the follow-up assessment none of the between-group comparisons yielded significant t-values.

Per cent overweight. The results for this measure (table 7) were essentially the same as for weight in kg.

Table 7: Per cent overweight for the three groups before, after and at follow-up. Statistical comparisons within and between groups. (n=15 in each group).

	Before	After	F.-up	B.vs. F-up	Comparison	After	F.-up
Behavioral	36.2	21.5	28.6	-7.6	B vs P	NS	NS
	xxx		xx	x			
Pharmacological	40.6	31.1	38.9	-1.7	B vs C	xx	NS
	xx		xxx	NS			
Waiting-list contr	28.8	23.8	25.1	-3.7	P vs C	NS	NS
	xx		NS	NS			

Weight reduction index. The results of study IV in terms of this index which takes into account initial weight, height, amount overweight, target weight, and weight loss, is shown in table 8.

Table 8: Weight-reduction index for the three groups before, after and at follow-up. Statistical comparisons within and between groups. (n=15 in each group).

	After	F.-up	Comparison	After	F.-up
Behavioral	61.6	33.1	B vs P	x	NS
	xx				
Pharmacological	35.1	12.7	B vs C	xx	NS
	xx				
Waiting-list contr	23.0	23.2	P vs C	NS	NS
	NS				

At post-treatment the behavioral group had a significantly higher index (61.6) than the pharmacological group (35.1) and the control group (23.2). The difference between the pharmacological and the control group was not significant and at follow-up none of the groups differed significantly from each other.

Conclusions. The (somewhat tentative) conclusion that can be drawn from this study is that the behavioral method was more effective than the pharmacological in reducing the subjects' overweight. Furthermore, it is necessary that the person treated continues to apply the principles learned during treatment in order to maintain the reduced weight that is obtained.

The most plausible explanation for the results of this study is that it is more effective to teach a person new ways of eating and exercising than to suppress his appetite by giving him a drug. One

alternative explanation to the results is that it is the therapeutic contact per se that is important and as the behavioral group received 2.5 times as much therapist contact as the pharmacological group this explanation could be valid. This should be tested in further research. However, most of the research on the eating habits of obese persons show that they, to a much larger extent than normal-weight persons, start eating on external cues (e.g. the sight of food) rather than internal cues, e.g. stomach contractions (Schachter 1971). If these results are valid an appetite suppressing drug would not be of great value since the obese person does not react much to internal cues in the first place.

General conclusions.

The general conclusion that can be drawn from the present studies is that the applied behavioral methods have yielded significantly better results than the control conditions in three of the four studies. The drug addicts (I) and the chronic schizophrenics (II) were more active during the token economy phases than during the control phases. The obese subjects (IV) in the behavioral group lost more weight than both the control subjects and those receiving pharmacological treatment. In study III, the stutterers receiving either of the behavioral methods did not improve more than the untreated control subjects. The clinical applicability of these methods are discussed in the next section.

GENERAL DISCUSSION

In this section I will first discuss some pertinent research issues in connection with the treatment techniques evaluated in the present project. Then follows a general discussion concerning the applicability in a therapeutic situation, of the methods used in the present experiment.

The token economy program (I and II) has been used for 15 years in a wide variety of settings (Kazdin 1975). However, there is to date not sufficient empirical evidence to tell what factors are responsible for the effects that undoubtedly are achieved with the token economy. This is an unsatisfactory state of affairs especially since the research trend in this field seems to be expanding the token economy to new psychological problem areas instead of concentrating on the basic questions. One of these questions is the effects of non-contingent reinforcement (NCR), and some of the results of study II did not confirm the generally accepted principle (Gripp & Magaro 1974), that NCR is useless: Another important issue is the relative efficiency of the token economy versus other types of treatments. From a therapeutic point of view the most urgent issue concerns the question of how to transfer and maintain the effects obtained in the treatment program, to the patients' natural environments.

Concerning the place for behavioral methods in the treatment of drug addicts much research is needed. In reviewing this field (Götestam, Melin & Öst 1976) only two studies were found that were adequately controlled to permit conclusions. The present token economy program served primarily as a management program (i.e. to improve the situation on the ward) and nothing is known about the long-term effects, concerning for example relapse in drug abuse. Furthermore, treatment programs that take into consideration both the drug-taking behavior, other problem behaviors, and the drug addict's social situation at large, need to be developed and evaluated experimentally.

In the treatment of chronic schizophrenic patients (II) the behavioral methods have been shown to be very valuable (e.g. Liberman 1972, Liberman, Wallace, Teigen & Davis 1974, DiScipio 1974). Some of the problems in need of investigation within this area are how to design a token economy that simultaneously and effectively can treat patients at different levels of functioning, what methods to use for the minority of patients not responding to the token reinforcement (Kazdin 1973), and how to prepare the relatives for the discharge of the patients (O'Brien & Azrin 1973).

Concerning the treatment of stutterers (III) further research should ascertain the efficiency of metronome-conditioned speech retraining both in relation to no-treatment and to the recently developed techniques of Azrin & Nunn (1974) and Webster (1974). From a therapeutic point of view research on different factors that may predict which method to prefer in the treatment of a certain type of stuttering is urgently needed.

The reviewers on behavior therapy for obesity (VI, p. 1) agree that most of the behavioral methods that have been applied to obesity are effective in reducing overweight, but only a few studies have presented long-term follow-ups. The most important area of research in this field is to design and evaluate methods for maintaining, on a long-term basis, the results obtained in the treatment Another urgent issue is the application and evaluation of behavioral methods in the treatment of severly (75-100%) overweight persons.

The therapeutic applicability

A general aim of the present project was to perform experimental tests of behavioral methods in the way they have been used therapeutically. The experimental situation does, however, pose certain demands, e.g. all subjects treated in the same group are to receive the same treatment, the time limits are fixed etc. This means that the flexibility that characterizes a therapeutic situation can only be approximated in an experiment. One of the most important compo-

nents of the behavior therapy situation is the thorough behavior analysis that must always precede treatment (Kanfer & Saslow 1969, Gottman & Leiblum 1974). In a group experiment there are generally few possibilities to make this kind of behavior analysis. In the present studies individual behavior analysis were, to some extent, made in study II, for the individual programs that were applied to some of the patients, and study IV. Apart from these examples the treatment techniques were decided beforehand and could not be changed as a result of individual behavior analysis.

In an individual therapy situation the techniques evaluated in the present experiments would be used, provided that a thorough behavior analysis showed them to be suitable for the client. This means that a client (with his problems)would not be "adjusted" to a rigidly defined technique, but the technique would be fitted to the characteristics and needs of the client. Thus, the therapist has a definite advantage over the researcher as he (in most situations) has an array of techniques to apply in designing a unique treatment plan for his client (Öst 1975).

In conclusion then, the treatment techniques evaluated in the present series of studies are readily applicable in therapeutic situation. Furthermore, the results would probably be better than in the experimental situation as the therapist (through the behavior analysis) can match or design suitable techniques to a certain client.

REFERENCES

Abramson, E.E. A review of behavioral approaches to weight control. Behaviour Research and Therapy, 1973, 11, 547-556.

Andersson, B., Danielsson, A. & Westerling, A. Beteendemodifikation. Teoretisk diskussion och praktiska försök på en institution för utvecklingsstörda. Psykologexamensarbete, Psyk. inst., Uppsala Universitet, 1972.

Ayllon, T. & Azrin, N.H. The Token Economy. New York: Appleton. 1968.

Azrin, N.H. & Nunn, R.G. A rapid method of eliminating stuttering by a regulated breathing approach. Behaviour Research and Therapy, 1974, 12, 279-286.

Baer, D.M., Wolf, M.M. & Risley, T.R. Some current dimensions of applied behavior analysis. Journal of Applied Behavior Analysis, 1968, 1, 91-97.

Barlow, D.H. & Hersen, M. Single-case experimental designs. Uses in applied clinical settings. Archives of General Psychiatry, 1973, 319-325.

Bellack, A.S. Behavior therapy for weight reduction. Addictive Behaviors, 1975, 1, 73-82.

Bergin, A.E. & Garfield, S.L: (Eds.) Handbook of Psychotherapy and Behavior Change: An empirical analysis. New York: Wiley, 1971.

Bergin, A.E. & Strupp, H.H. Changing Frontiers in the Science of Psychotherapy. Chicago: Aldine, 1972.

Botella, C., Sandström, E. & Wadelius, L. Beteendeterapi och fetma: litteraturöversikt och experimentell prövning. Psykologexamensarbete, Psyk. inst., Uppsala Universitet, 1975.

Brady, J.P. Studies on the metronome effect on stuttering. Behaviour Research and Therapy, 1969, 7, 197-204.

Brady, J.P. Metronome-conditioned speech retraining for stuttering. Behavior Therapy, 1971, 2, 129-150.

Callner, D.A. Behavioral treatment approaches to drug abuse: a critical review of the research. Psychological Bulletin, 1975, 82, 143-164.

Campbell, D.T. & Stanley, J.C. Experimental and Quasi-experimental designs for Research. Chicago: Rand McNally, 1966.

Cherry, E.C. & Sayers, B.M. Experiments upon the total inhibition of stammering by external control, and some clinical results. Journal of Psychosomatic Research, 1956, 1, 233-246.

Claeson, L-E. & Malm, U. Electro-aversion therapy of chronic alcoholism. Behaviour Research and Therapy, 1973, 11, 663-665.

DiScipio, W.J. (Ed.) The Behavioral Treatment of Psychotic Illness. Advances in Theory and Technique. New York: Behavioral Publications, 1974.

Eysenck, H.J: (Ed.) Behaviour Therapy and the Neuroses. Oxford: Pergamon Press, 1960.

Gottman, J.M: & Leiblum, S.R. How to do Psychotherapy and How to Evaluate it. New York: Holt, Rinehart, and Winston, 1974.

Gripp, R.F. & Magaro, P.A. The token economy program in the psychiatric hospital: A review and analysis. Behaviour Research and Therapy, 1974, 12, 205-228.

Gunne, L.M. Narkomani-medicinska fakta. Göteborg: Akademiförlaget 1975.

Götestam, K.G., Melin, L. & Öst, L-G. Behavioral techniques in the treatment of drug abuse: An evaluative review. Addictive Behaviors, 1976 (in press).

Hall, S.M. & Hall, R.G. Outcome and methodological considerations in the behavioral treatment of obesity. Behavior Therapy, 1974, 5, 352-364.

Hartmann, D.P. & Atkinson, C. Having your cake and eating it too: A note on some apparent contradictions between therapeutic achievements and design requirements in N=1 studies. Behavior Therapy, 1973, 4, 589-591.

Hoon, P.W. & Lindsley, O.S. A comparison of behavior and traditional therapy publication activity. American Psychologist, 1974, 29, 694-697.

Jeffrey, D.B. Self-control: Methodological issues and research trends In M.J. Mahoney & C.E. Thoresen (Eds.) Self-Control: Power to the Person. Monterey, Calif.: Brooks/Cole, 1974. (a).

Jeffrey, D.B. Some methodological issues in research on obesity: Psychological Reports, 1974, 35, 623-626. (b).

Johnsson, H. Social modellering inom kriminalvården. Psykologexamensarbete, Ped. inst., Uppsala Universitet, 1973.

Johnson, W., Darley, F.L: & Spriesterbach, D.C. Diagnostic Methods in Speech Pathology. New York: Harper & Row, 1963.

Johannesson, G. & Persson, E. Beteendeterapi och stamning. Litteraturöversikt och experimentell prövning. Psykologexamensarbete, Psyk. inst., Uppsala Universitet, 1974.

Kanfer, F.H: & Saslow, G. Behavioral Diagnosis. In C.M. Franks (Ed.) Behavior Therapy: Appraisal and Status. New York: McGraw-Hill, 1969.

Kazdin, A.E. The failure of some patients to respond to token programs. Journal of Behavior Therapy and Experimental Psychiatry, 1973, 4, 7-14.

Kazdin, A.E. Recent advances in token economy research. In M. Hersen et al. (Eds.) Progress in Behavior Modification. Vol. 1. New York: Academic Press, 1975.

Kazdin, A.E. & Bootzin, R.R. The token economy: An evaluative review. Journal of Applied Behavior Analysis, 1972, 5, 343-372.

Kondas, O. The treatment of stammering in children by the shadowing method. Behaviour Research and Therapy, 1967, 5, 325-329.

Lang, P.J. Fear reduction and fear behavior: Problems in treating a construct. In J.M. Shlien (Ed.) Research in Psychotherapy. Vol. III. Washington: American Psychological Association, 1968.

Lang, P.J. The application of psychophysiological methods to the study of psychotherapy and behavior modification. In A.E. Bergin & S.L. Garfield (Eds.) Handbook of Psychotherapy and Behavior Change. New York: Wiley, 1971.

Liberman, R.P. Behavioral modification of schizophrenia: a review. Schizophrenia Bulletin, 1972, issue nr. 6, 37-48.

Liberman, R.P., Wallace, C., Teigen, J. & Davis, J. Interventions with psychotic behaviors. In K.S. Calhoun et al. (Eds.) Innovative Treatment Methods in Psychopathology. New York: Wiley, 1974.

Lindsley, O.R., Skinner, B.F. & Solomon, H.C. Studies in behavior therapy. Status report 1. Waltham: Metropolitan State Hospital, 1953.

Lloyd, K.E. & Garlington, W.K. Weekly variations in performance on a token economy psychiatric ward. Behaviour Research and Therapy, 1968, 6, 407-410.

Melin, L., Andersson, B.E. & Götestam, K.G. Contingency management in a methadone maintenance treatment program. Addicitve Behaviors, 1975, 1, 151-158.

Melin,L. & Götestam, K.G. A contingency management program on a drug-free unit for intravenous amphetamine addicts. Journal of Behavior Therapy and Experimental Psychiatry, 1973, 4, 331-337.

O'Brien, F. & Azrin, N.H. Interaction-Priming: A method of reinstating patient-family relationships. Behaviour Research and Therapy, 1973, 11, 133-136.

Paul, G.L. Chronic mental patient: Current status - future directions. Psychological Bulletin, 1969, 71, 81-94.

Sandberg, O. Beteendeterapi i kriminalvården. En tillämpningsstudie. Stockholm: Kriminalvårdsstyrelsens press- och informationstjänst, 1975.

Schachter, S. Emotion, Obesity, and Crime. New York: Academic Press, 1971.

Siegel, S. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill, 1956.

Stolz, S.B. Overview of NIMH support of research in behavior therapy. Journal of Applied Behavior Analysis, 1973, 6, 509-515.

Stuart, R.B. & Davis, B. Slim Chance in a Fat World. Champaign, Ill.: Research Press, 1972.

Stunkard, A.J. New therapies for the eating disorders. Archives of General Psychiatry, 1972, 26, 391-398.

Wallin, T. Beteendemodifikation och studieaktivitet på låg- och mellanstadiet. Doktorsavhandling, Psyk. Inst., Götebors Universitet, 1975.

Webster, R.L. A behavioral analysis of stuttering: Treatment and Theory. In K.S. Calhoun et al. (Eds.) Innovative Treatment Methods in Psychopathology. New York: Wiley, 1974.

Wolpe, J. Psychotherapy by Reciprocal Inhibition. Stanford: Stanford University Press, 1958.

Yates, A.J. Behavior Therapy. New York: Wiley, 1970.

Yates, A.J. Theory and Practice in Behavior Therapy. New York: Wiley, 1975.

Öst, L-G. En modell för praktisk beteendeterapi. Nordisk Psykiatrisk Tidskrift, 1975, 29, 279-291.

C O N T E N T S

PREFACE 3

INTRODUCTION 5

Purpose 6

METHOD 8

Subjects 8

Voluntary or compulsory participation 9

Treatments 11

Designs 13

Assessment 15

Statistical methods 18

RESULTS AND CONCLUSIONS 19

Study I (drug addicts) 19

Study II (chronic schizophrenics) 21

Study III (stutterers) 22

Study IV (obese) 24

General conclusions 27

GENERAL DISCUSSION 28

The therapeutic applicability 29

REFERENCES 31

Pris 6 kronor

ISSN 0345-1402